REMARKS

Applicant has carefully reviewed and considered the Final Office Action mailed on November 28, 2005, and the references cited therewith.

Claims 1, 7-8, 10, 12-13, 18, 22-24, and 26 are amended, and no claims are canceled or added; as a result, claims 1-26 are now pending in this application.

§ 102 Rejection of the Claims

Claims 18-22 were rejected under 35 USC § 102(b) as being anticipated by Segerstrom et al. (U.S. Patent No. 6,213,580). Applicant respectfully traverses the rejection as follows.

The Segerstrom reference appears to describe, "[A]n apparatus and related method for automatically aligning one or more print head modules in an ink jet printing system". (Abstract). The reference does not show calculating a right triangle with each of two points at an endpoint of an hypotenuse of the right triangle and defining two reference points based upon the position of one of the two points and a vertex of the right angle of the right triangle.

In contrast, independent claim 18 as amended, recites:

> calculating a right triangle with each of the two points at an endpoint of an hypotenuse of the right triangle;
> defining two reference points based upon the position of one of the two points and a vertex of a right angle of the right triangle;

The amendment to independent claim 18 shown above is supported in the specification and drawings of the present application as originally presented. Specifically, support can be found on: page 8, lines 28-31; page 10, line 31, through page 11, line 3; page 11, line 31, through page 12, line 7; page 14, lines 24-32; page 15, lines 1-11; and page 15, line 26, through page 16, line 4. Further support is illustrated in Figures 3A-3C and Figure 4. For example, page 14, lines 25-28, recites:

> [T]o determine the distance between the first and second printheads in the Y-axis direction, the software can measure the X and Y coordinates 460, which is a vertical and horizontal point intersection resulting in a right triangle.

Page 15, line 26, through page 16, line 4, goes on to recite:

> [I]n block 520, the method can include defining two reference points based on the position of the two points. The two reference points can include points on a reference line such that an imaginary line drawn from a reference point to a point on print media printed by the stationary, staggered printhead array forms a right angle between the reference line and the imaginary line.

As such, Applicant respectfully submits that each and every element and limitation of independent claim 18, as amended, is not present in the Segerstrom reference. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the § 102 rejection of independent claim 18, as amended, as well as those claims that depend therefrom.

§ 103 Rejection of the Claims

Claims 1-3, 6-7, and 9-10 were rejected under 35 USC § 103(a) as being unpatentable over Shimizu, et al. (U.S. Patent No. 6,550,886) in view of Cowger (U.S. Patent No. 5,568,172). Applicant respectfully traverses the rejection as follows.

With regard to independent claim 1, as amended, the Examiner cites the Shimizu reference as describing, "[a] detection means is used for detecting a positional error between ink drops with respect to a reference position C11, L41-45". Shimizu states in column 7, lines 14-19, referring to Figure 8:

> [T]he Y-position detection pattern 522 is used for detecting and correcting the ink-droplet impact positions with respect to the Y direction.
>
> In FIG. 8, the deflection amount detecting pattern 520 and the Y-position detection pattern 522 include a plurality of line segments extending in the sheet feed direction . . .

Shimizu goes on to state in column 7, lines 23-26:

> [A]lthough the patterns 520, 522 of FIG. 8 each includes four [parallel] line segments only, FIG. 8 is a simplified diagram and the patterns 520, 522 include more than four line segments as described below.

The Shimizu reference appears to describe a Y-position detection pattern that includes at least four parallel line segments extending in the sheet feed direction. The reference does not show a controller to interpret the positioning data to identify a Y axis

offset of at least two ink drops based on calculating a right triangle using the positioning data.

The Examiner cites the Cowger reference as describing, "[A] controller that interprets the data to identify a Y-axis offset of at least two ink drops". (Col. 5, lines 18-21). The reference goes on to state in column 5, lines 21-26, referring to Figure 2:

> [B]ecause the difference is calculated by the sensors incorporating LEDs 60-66 at one end of each print bar and by the sensors incorporating LEDs 52-58 at the other end of each print bar, the difference can be extrapolated along the length of the print bar thereby providing a different delay, or advance, for each nozzle along the longitudinal axis of the bar in order to accurately register the dots.

The reference appears to describe registering the dots through use of pairs of LEDs positioned at opposite ends of each print bar, thereby allowing calculation of differences from the expected distances. The reference does not show a controller to interpret the positioning data to identify a Y axis offset of at least two ink drops based on calculating a right triangle using the positioning data.

In contrast, Applicant's claim 1, as amended, recites, "[a] controller to interpret the positioning data to identify a Y axis offset of at least two ink drops based on calculating a right triangle using the positioning data."

The amendment to independent claim 1 shown above is supported in the specification and drawings of the present application as originally presented. Specifically, support can be found on: page 14, lines 24-32; page 15, lines 1-11; and page 15, line 26, through page 16, line 4. Further support is illustrated in Figures 3A-3C and Figure 4. For example, page 14, lines 25-28, recites:

> [T]o determine the distance between the first and second printheads in the Y-axis direction, the software can measure the X and Y coordinates 460, which is a vertical and horizontal point intersection resulting in a right triangle.

In addition, Applicant's independent claim 10, as amended, recites:

> [a] controller to interpret the ink placement pattern information to identify X and Y axis offsets of at least two printheads by calculating a right triangle based upon the ink placement pattern information.

As such, Applicant respectfully submits that each and every element and limitation of independent claims 1 and 10, as amended, is not taught or suggested in the

Shimizu and Cowger references, either individually or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the § 103 rejection of independent claims 1 and 10, as amended, as well as those claims that depend therefrom.

Claims 4-5, 8, 11, and 12 were rejected under 35 USC § 103(a) as being unpatentable over Shimizu, et al. (U.S. Patent No. 6,550,886) in view of Cowger (U.S. Patent No. 5,568,172), and further in view of Segerstrom, et al. (U.S. Patent No. 6,213,580). Applicant respectfully traverses the rejection as follows.

Claims 4-5, and 8 depend from independent claim 1 and claims 11 and 12 depend from independent claim 10. Applicant respectfully submits that independent claims 1 and 10, as amended, are in condition for allowance. From Applicant's review of the Segerstrom reference, the reference does not cure the deficiencies of the Shimizu and Cowger references. That is, Segerstrom does not teach or suggest:

> [a] controller to interpret the positioning data to identify a Y axis offset of at least two ink drops based on calculating a right triangle using the positioning data.

as recited in Applicant's independent claim 1, as amended. Nor does Segerstrom teach or suggest:

> [a] controller to interpret the ink placement pattern information to identify X and Y axis offsets of at least two printheads by calculating a right triangle based upon the ink placement pattern information.

as recited in Applicant's independent claim 10, as amended.

As such, Applicant respectfully submits that each and every element and limitation of independent claims 1 and 10, as amended, is not taught or suggested by the Shimizu, Cowger, and Segerstrom references, either individually or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the § 103 rejection of dependent claims 4-5, 8, 11, and 12.

Claims 13, 16, and 17 were rejected under 35 USC § 102(b) as being anticipated by Wyngaert et al. (U.S. Patent No. 6,554,398) in view of Shimizu, et al. (U.S. Patent No. 6,550,886). Applicant understands this to be a rejection under 35 U.S.C. § 103(a) and respectfully traverses the rejection as follows.

With regard to independent claim 13, as amended, the Examiner stated that "Wyngaert et al. does not teach X and Y offsets as selected from the group including: X and Y offsets of the two printheads relative to each other, and X and Y offsets of the two printheads relative to a media advancement direction." However, the Examiner cited the Shimizu reference as describing, "[t]he X and Y offsets of the two printheads (a detection device used to detect the shifting amount of ink droplets in the X-axis and Y-axis C7, L65+) relative to a media advancement direction." Shimizu states in column 7, lines 14-19, referring to Figure 8:

> [T]he Y-position detection pattern 522 is used for detecting and correcting the ink-droplet impact positions with respect to the Y direction.
>
> In FIG. 8, the deflection amount detecting pattern 520 and the Y-position detection pattern 522 include a plurality of line segments extending in the sheet feed direction . . .

Shimizu goes on to state in column 7, lines 23-26:

> [A]lthough the patterns 520, 522 of FIG. 8 each includes four [parallel] line segments only, FIG. 8 is a simplified diagram and the patterns 520, 522 include more than four line segments as described below.

The Shimizu reference appears to describe a Y-position detection pattern that includes at least four parallel line segments extending in the sheet feed direction. The reference does not show X and Y offsets of the two printheads relative to a single reference line that is parallel to a media advancement direction.

In contrast, Applicant's independent claim 13, as amended, recites, "X and Y offsets of the two printheads relative to a single reference line that is parallel to a media advancement direction.

The amendment to independent claim 13 shown above is supported in the specification and drawings of the present application as originally presented. Specifically, support can be found on: page 5, lines 11-13; page 5, lines 29-30; page 6, lines 6-9; page 7, lines 24-26; page 8, lines 12-14, 22-23, 28-31, and 33 through page 9,line 13; page 12, lines 25-27; page 13, lines 1-6; and page 16, lines 13-15 and 22-28. Further support is illustrated in Figures 2, 3A, and 4. For example, page 6, lines 6-9, recites, referring to Figure 2:

> [R]eference line 250 can be a vertical line printed by repeatedly ejecting ink from a nozzle of one of the printheads (e.g., the right most nozzle of the second column 122-N of second printhead 118. The reference line 250 is shown substantially parallel to the direction of media travel.

Page 8, lines 26-31, goes on to recite, referring to Figure 3A:

> The data can be analyzed by identifying X and Y coordinates of the endpoints 312-1 and 312-N. Software embodiments can calculate intersecting points 352 and 356, positioned horizontally to the endpoints 312-1 and 312-N and intersecting vertical reference line 350, can be calculated respectively.

As such, Applicant respectfully submits that each and every element and limitation of independent claim 13, as amended, is not taught or suggested in the Wyngaert and Shimizu references, either individually or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the § 102, or § 103, rejection of independent claim 13, as amended, as well as those claims that depend therefrom.

Claim 16 was rejected under 35 USC § 103(a) as being unpatentable over Wyngaert et al. (U.S. Patent No. 6,554,398) and Shimizu, et al. (U.S. Patent No. 6,550,886). Applicant respectfully traverses the rejection as follows.

Claim 16 depends from independent claim 13. Applicant respectfully submits that independent claim 13, as amended, is in condition for allowance. From Applicant's review of the Wyngaert and Shimizu references, the references do not teach or suggest, "X and Y offsets of the two printheads relative to a single reference line that is parallel to a media advancement direction", as recited by independent claim 13, as amended.

As such, Applicant respectfully submits that each and every element and limitation of independent claim 13, as amended, is not taught or suggested by the Wyngaert and Shimizu references, either individually or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the § 103 rejection of dependent claim 16.

Claims 14 and 15 were rejected under 35 USC § 103(a) as being unpatentable over Wyngaert et al. (U.S. Patent No. 6,554,398) and Shimizu, et al. (U.S. Patent No. 6,550,886), and further in view of Segerstrom, et al. (U.S. Patent No. 6,213,580). Claim

23 was included in this rejection, although the claim depends from independent claim 18, not independent claim 13. Applicant respectfully traverses the rejection as follows.

Claims 14 and 15 depend from independent claim 13 and claim 23 depends from independent claim 18. Applicant respectfully submits that independent claims 13 and 18, as amended, are in condition for allowance. From Applicant's review of the Segerstrom reference, the reference does not cure the deficiencies of the Wyngaert and Shimizu references. That is, Segerstrom does not teach or suggest, "X and Y offsets of the two printheads relative to a single reference line that is parallel to a media advancement direction", as recited in independent claim 13, as amended, nor does Segerstrom teach or suggest:

> calculating a right triangle with each of the two points at an endpoint of an hypotenuse of the right triangle;
> defining two reference points based upon the position of one of the two points and a vertex of a right angle of the right triangle;

as recited in independent claim 18, as amended.

As such, Applicant respectfully submits that each and every element and limitation of independent claims 13 and 18, as amended, is not taught or suggested by the Wyngaert, Shimizu, and Segerstrom references, either individually or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the § 103 rejection of dependent claims 14-15, and 18.

Claims 24 and 25 were rejected under 35 USC § 103(a) as being unpatentable over Serra et al. (U.S. Patent No. 6,773,086) in view of Segerstrom, et al. (U.S. Patent No. 6,213,580) and Beauchamp (U.S. Patent No. 6,474,765). Applicant respectfully traverses the rejection as follows.

With regard to independent claim 24, as amended, the Serra reference appears to describe a method that "[r]educes misalignment of a pair of staggered fluid ejector assemblies positioned along a first axis perpendicular to a second axis along which media moves past the assemblies." (Abstract). The Segerstrom reference appears to describe, "[a]n apparatus and related method for automatically aligning one or more print head modules in an ink jet printing system". (Abstract). In addition, the Beauchamp reference appears to describe a method that "[p]roduces printing substantially free of visual angulation artifacts in such elongated, multiple-line-segment

type of lines." (Abstract). The references do not teach or suggest calculating a right triangle with each of two points at an endpoint of an hypotenuse of the right triangle and defining two reference points based upon the position of one of the two points and a vertex of the right angle of the right triangle.

In contrast, Applicant's independent claim 24 as amended, recites:

> calculating a right triangle with each of the two points at an endpoint of an hypotenuse of the right triangle;
> defining two reference points based upon the position of one of the two points and a vertex of a right angle of the right triangle;

The amendment to independent claim 24 shown above is supported in the specification and drawings of the present application as originally presented. Specifically, support can be found on: page 8, lines 28-31; page 10, line 31, through page 11, line 3; page 11, line 31, through page 12, line 7; page 14, lines 24-32; page 15, lines 1-11; and page 15, line 26, through page 16, line 4. Further support is illustrated in Figures 3A-3C, and Figure 4. For example, page 14, lines 25-28, recites:

> [T]o determine the distance between the first and second printheads in the Y-axis direction, the software can measure the X and Y coordinates 460, which is a vertical and horizontal point intersection resulting in a right triangle.

Page 15, line 26, through page 16, line 4, goes on to recite:

> [I]n block 520, the method can include defining two reference points based on the position of the two points. The two reference points can include points on a reference line such that an imaginary line drawn from a reference point to a point on print media printed by the stationary, staggered printhead array forms a right angle between the reference line and the imaginary line.

As such, Applicant respectfully submits that each and every element and limitation of independent claim 24, as amended, is not taught or suggested in the Serra, Segerstrom, and Beauchamp references, either individually or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the § 103 rejection of independent claim 24, as amended, as well as those claims that depend therefrom.

Claim 26 was rejected under 35 USC § 103(a) as being unpatentable over Serra et al. (U.S. Patent No. 6,773,086) in view of Segerstrom, et al. (U.S. Patent No.

6,213,580) and Shimizu, et al. (U.S. Patent No. 6,550,886). Applicant respectfully traverses the rejection as follows.

With regard to independent claim 26, as amended, the Serra reference appears to describe a method that "[r]educes misalignment of a pair of staggered fluid ejector assemblies positioned along a first axis perpendicular to a second axis along which media moves past the assemblies." (Abstract). The Segerstrom reference appears to describe, "[a]n apparatus and related method for automatically aligning one or more print head modules in an ink jet printing system are provided." (Abstract). In addition, the Shimizu reference appears to describe a Y-position detection pattern that includes at least four parallel line segments extending in the sheet feed direction. (Col. 7, lines 14-19 and 23-26). The references do not teach or suggest repeatedly ejecting ink from a nozzle while advancing the print media to print a single reference line that is parallel to a print media advancement direction.

In contrast, Applicant's independent claim 26, as amended, recites, "repeatedly ejecting ink from a nozzle while advancing the print media to print a single reference line that is parallel to a print media advancement direction."

The amendment to independent claim 26 shown above is supported in the specification and drawings of the present application as originally presented. Specifically, support can be found on: page 5, lines 11-13; page 5, lines 29-30; page 6, lines 6-9; page 7, lines 24-26; page 8, lines 12-14, 22-23, 28-31, and 33 through page 9,line 13; page 12, lines 25-27; page 13, lines 1-6; and page 16, lines 13-15 and 22-28. Further support is illustrated in Figures 2, 3A, and 4. For example, page 6, lines 6-9, recites, referring to Figure 2:

> [R]eference line 250 can be a vertical line printed by repeatedly ejecting ink from a nozzle of one of the printheads (e.g., the right most nozzle of the second column 122-N of second printhead 118. The reference line 250 is shown substantially parallel to the direction of media travel.

As such, Applicant respectfully submits that each and every element and limitation of independent claim 26, as amended, is not taught or suggested in the Serra, Segerstrom, and Shimizu references, either individually or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the §

103 rejection of independent claim 26, as amended, as well as those claims that depend therefrom.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney Gregg W. Wisdom at (360) 212-8052.

At any time during the pendency of this application, please charge any additional fees or credit overpayment to the Deposit Account No. 08-2025.

CERTIFICATE UNDER 37 CFR §1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS AF Commissioner for Patents, P.O. BOX 1450 Alexandria, VA 22313-1450, on this 19th day of January, 2006.

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